In the Claims:

Please amend the claims as follows:

1. (currently amended) A method ~~for scheduling at least one out of K transmission channels $k=1,..,K$ with respective $N_{t,k}$ transmission interfaces and respective $N_{r,k}$ reception interfaces for the transmission of data symbols modulated according to a non-orthonormal matrix modulation that modulates data symbols in both a non-orthogonal spatial domain and at least one orthogonal domain, wherein at least one equivalent channel matrix G_k can be defined that transforms said data symbols into data symbols that have been matrix modulated, transmitted over $N_{t,k}$ transmission interfaces and received at $N_{r,k}$ reception interfaces of one of said transmission channels $k=1,..,K$, and wherein an equivalent channel correlation matrix $R_k = G_k^H \cdot G_k$ of said at least one equivalent channel matrix G_k is not proportional to the identity matrix, said method~~ comprising:

- calculating a respective channel quality indicator q_k for at least one of ~~said~~ K transmission channels $k=1,..,K$ with respective $N_{t,k}$ transmission interfaces and respective $N_{r,k}$ reception interfaces, and
- scheduling at least one of said K transmission channels for the transmission of data symbols modulated according to a non-orthonormal matrix modulation that modulates data symbols in both a non-orthogonal spatial domain and at least one orthogonal domain, wherein at least one equivalent channel matrix G_k can be defined that transforms said data symbols into data symbols that have been matrix modulated, transmitted over $N_{t,k}$ transmission interfaces and received at $N_{r,k}$ reception interfaces of one of said transmission channels $k=1,..,K$, wherein an equivalent channel correlation matrix $R_k = G_k^H \cdot G_k$ of said at least one equivalent channel matrix G_k is not proportional to the identity matrix~~said matrix modulated data symbols~~, and wherein said scheduling is at least partially based on said calculated channel quality indicators q_k.

2. (currently amended) The apparatus ~~method~~ according to claim 25~~1~~, wherein said calculation module is configured to derive said respective channel quality indicator q_k ~~is derived~~ for at least one of said K transmission channels from said equivalent channel correlation matrix R_k.

3. (currently amended) The apparatus~~method~~ according to claim 2, wherein said calculation module is configured to calculate said respective channel quality indicator q_k ~~is calculated~~ for at least one of said K transmission channels as a function of the determinant of a linear function of said equivalent channel correlation matrix R_k.

4. (currently amended) The apparatus ~~method~~ according to claim 2, wherein said calculation module is configured to calculate said respective channel quality indicator q_k ~~is calculated~~ for at least one of said K transmission channels as a function of the trace of said equivalent channel correlation matrix R_k.

5. (currently amended) The apparatus~~method~~ according to claim 2, wherein said calculation module is configured to calculate said respective channel quality indicator q_k ~~is calculated~~ for at least one of said K transmission channels as a function of the trace of the inverse of said equivalent channel correlation matrix R_k.

6. (currently amended) The apparatus ~~method~~ according to claim 25~~1~~, wherein said calculation module is configured to calculate said respective channel quality indicator q_k ~~is calculated~~ for at least one of said K transmission channels as a function of the elements of a channel matrix H_k, which defines said at least one transmission channel, and to derive ~~wherein~~ said function ~~is derived~~ from said equivalent channel correlation matrix R_k under exploitation of the structural properties of said equivalent channel correlation matrix R_k.

7. (currently amended) The apparatus~~method~~ according to claim 25~~1~~, wherein said non-orthonormal matrix modulation is a~~n ABBA~~ non-orthonormal matrix modulation that maps

a block of 4 data symbols onto $N_{t,k}=4$ transmission interfaces in *4* units of said at least one orthogonal domain and is based on the non-orthonormal combination of two space-time transmit diversity codes.

8. (currently amended) The apparatus~~method~~ according to claim 6, wherein said equivalent channel correlation matrix R_k is of the form

$$R_k = \begin{bmatrix} p_k & 0 & n_k & 0 \\ 0 & p_k & 0 & n_k \\ n_k & 0 & p_k & 0 \\ 0 & n_k & 0 & p_k \end{bmatrix}$$, and

wherein p_k and n_k are real-valued functions of the elements of said channel matrix H_k.

9. (currently amended) The apparatus~~method~~ according to claim 8, wherein said calculation module is configured to calculate said respective channel quality indicator q_k ~~is calculated~~ for at least one of said K transmission channels as a function of $\left((a+p_k)^2 - n_k^2\right)^2$, and wherein a is a constant value.

10. (currently amended) The apparatus~~method~~ according to claim 25~~1~~, wherein said non-orthonormal matrix modulation is a ~~DABBA~~ non-orthonormal matrix modulation that maps a block of 8 data symbols onto $N_{t,k}=4$ transmission interfaces in *4* units of said at least one orthogonal domain and is based on the non-orthonormal combination of four space-time transmit diversity codes.

11. (currently amended) The apparatus~~method~~ according to claim 6, wherein said equivalent channel correlation matrix R_k is of the form

$$R_k = \begin{bmatrix} p_{k,1}+p_{k,2} & 0 & n_{k,1} & 0 & p_{k,1}-p_{k,2} & 0 & i\cdot n_{k,2} & s_k^* \\ 0 & p_{k,1}+p_{k,2} & 0 & n_{k,1} & 0 & p_{k,1}-p_{k,2} & -s_k & i\cdot n_{k,2} \\ n_{k,1} & 0 & p_{k,1}+p_{k,2} & 0 & i\cdot n_{k,2} & -s_k^* & -p_{k,1}+p_{k,2} & 0 \\ 0 & n_{k,1} & 0 & p_{k,1}+p_{k,2} & s_k & i\cdot n_{k,2} & 0 & -p_{k,1}+p_{k,2} \\ p_{k,1}-p_{k,2} & 0 & i\cdot n_{k,2} & s_k^* & p_{k,1}+p_{k,2} & 0 & n_{k,1} & 0 \\ 0 & p_{k,1}-p_{k,2} & -s_k & i\cdot n_{k,2} & 0 & p_{k,1}+p_{k,2} & 0 & n_{k,1} \\ i\cdot n_{k,2} & -s_k^* & -p_{k,1}+p_{k,2} & 0 & n_{k,1} & 0 & p_{k,1}+p_{k,2} & 0 \\ s & i\cdot n_{k,2} & 0 & -p_{k,1}+p_{k,2} & 0 & n_{k,1} & 0 & p_{k,1}+p_{k,2} \end{bmatrix} \text{wherein}$$

$p_{k,1}$, $p_{k,2}$, $n_{k,1}$ and $n_{k,2}$ are real-valued functions of the elements of said channel matrix H_k and wherein s_k is a complex-valued function of the elements of said channel matrix H_k.

12. (currently amended) The apparatus~~method~~ according to claim 11, wherein said calculation module is configured to calculate said respective channel quality indicator q_k ~~is calculated~~ for at least one of said K transmission channels as a function of $\left(4\cdot p_{k,1}\cdot p_{k,2}+(p_{k,1}+p_{k,2})(a^2+2\cdot a)+n_{k,1}^2-n_{k,2}^2+|s_k|^2\right)^4$, and wherein a is a constant value.

13. (currently amended) The apparatus~~method~~ according to claim 25~~1~~, wherein said non-orthonormal matrix modulation is a ~~TSTTD~~ non-orthonormal matrix modulation that maps a block of 4 data symbols onto $N_{t,k}=2$ transmission interfaces in 2 units of said at least one orthogonal domain and is based on the non-orthonormal combination of two space-time transmit diversity codes.

14. (currently amended) The apparatus~~method~~ according to claim 6, wherein said equivalent channel correlation matrix R_k is of the form

$$R_k = \begin{bmatrix} p_{k,1}+p_{k,2} & 0 & p_{k,1}-p_{k,2} & s_k \\ 0 & p_{k,1}+p_{k,2} & s_k^* & p_{k,2}-p_{k,1} \\ p_{k,1}-p_{k,2} & s_k & p_{k,1}+p_{k,2} & 0 \\ s_k^* & p_{k,2}-p_{k,1} & 0 & p_{k,1}+p_{k,2} \end{bmatrix},$$

wherein $p_{k,1}$ and $p_{k,2}$ are real-valued functions of the elements of said channel matrix H_k and wherein s_k is a complex-valued function of the elements of said channel matrix H_k.

15. (currently amended) The apparatus~~method~~ according to claim 14, wherein said calculation module is configured to calculate said respective channel quality indicator q_k ~~is calculated~~ for at least one of said K transmission channels as a function of $\left(\det\,(aI + H_k^H H_k)\right)$, and wherein a is a constant value.

16. (currently amended) The apparatus~~method~~ according to claim 25~~1~~, wherein said non-orthonormal matrix modulation is a ~~DSTTD~~ non-orthonormal matrix modulation that maps a block of 4 data symbols onto $N_{t,k}=4$ transmission interfaces in 2 units of said at least one orthogonal domain and is based on the non-orthonormal combination of two space-time transmit diversity codes.

17. (currently amended) The apparatus~~method~~ according to claim 25~~1~~, wherein said non-orthonormal matrix modulation comprises space-time or space-frequency coding.

18. (currently amended) The apparatus~~method~~ according to claim 25~~1~~, wherein said non-orthonormal matrix modulation comprises a combination of at least two orthonormal matrix modulations.

19. (currently amended) A method ~~for scheduling at least one out of K transmission channels $k=1,..,K$ with respective $N_{t,k}$ transmission interfaces and respective $N_{r,k}$ reception interfaces for the transmission of data symbols, wherein at least two of said data symbols are transmitted in parallel from $N_{t,k}$ transmission interfaces of at least one of said K transmission channels, which is defined by a channel matrix H_k,~~
~~said method~~ comprising:

- calculating a respective channel quality indicator q_k for at least one of ~~said~~ K transmission channels $k=1,..,K$, wherein each transmission channel k has respective $N_{t,k}$ transmission interfaces and respective $N_{r,k}$ reception interfaces and is defined by a respective channel matrix H_k, wherein at least two data symbols are transmitted in

parallel from $N_{t,k}$ transmission interfaces of at least one of said K transmission channels, and~~,~~ wherein at least one of said respective channel quality indicators q_k is calculated as a function of the determinant of a linear function of a channel correlation matrix $H_k^H \cdot H_k$ of said channel matrix H_k, and

- scheduling at least one of said K transmission channels for the transmission of said data symbols, wherein said scheduling is at least partially based on said calculated channel quality indicators q_k.

20. (previously presented) The method according to claim 1, wherein at least one receiver uses a maximum likelihood algorithm or a linear estimator to estimate said data symbols that are transmitted over said scheduled transmission channel and received by said receiver via said reception interfaces of said scheduled transmission channel.

21. (currently amended) The apparatus~~method~~ according to claim 25~~1~~, wherein said scheduler is configured to schedule a transmission channel $k=1,..,K$ with the largest channel quality indicator q_k ~~is scheduled~~ for said transmission of said data symbols.

22. (currently amended) The apparatus~~method~~ according to claim 25~~1~~, wherein said transmission channels are transmission channels of a wireless communication system, and wherein said transmission and reception interfaces of said transmission channels are the transmit and receive antenna elements of one or several transmitters and one or several receivers, respectively.

23. (canceled)

24. (previously presented) A computer program product comprising a computer program with instructions stored in a memory, said instructions operable to cause a processor to perform the method of claim 1.

25. (currently amended) An apparatus ~~device for scheduling at least one out of K transmission channels $k=1,..,K$ with respective $N_{t,k}$ transmission interfaces and respective $N_{r,k}$ reception interfaces for the transmission of data symbols modulated according to a non-orthonormal matrix modulation that modulates data symbols in both a non-orthogonal spatial domain and at least one orthogonal domain, wherein at least one equivalent channel matrix G_k can be defined that transforms said data symbols into data symbols that have been matrix modulated, transmitted over $N_{t,k}$ transmission interfaces and received at $N_{r,k}$ reception interfaces of one of said transmission channels $k=1,..,K$, and wherein an equivalent channel correlation matrix $R_k = G_k^H \cdot G_k$ of said at least one equivalent channel matrix G_k is not proportional to the identity matrix, said device~~ comprising:

- a calculation module for calculating a respective channel quality indicator q_k for at least one of ~~said~~ K transmission channels $k=1,..,K$ with respective $N_{t,k}$ transmission interfaces and respective $N_{r,k}$ reception interfaces, and
- a scheduler for scheduling at least one of said K transmission channels for the transmission of data symbols modulated according to a non-orthonormal matrix modulation that modulates data symbols in both a non-orthogonal spatial domain and at least one orthogonal domain, wherein at least one equivalent channel matrix G_k can be defined that transforms said data symbols into data symbols that have been matrix modulated, transmitted over $N_{t,k}$ transmission interfaces and received at $N_{r,k}$ reception interfaces of one of said transmission channels $k=1,..,K$, wherein an equivalent channel correlation matrix $R_k = G_k^H \cdot G_k$ of said at least one equivalent channel matrix G_k is not proportional to the identity matrix~~said matrix modulated data symbols~~, and wherein said scheduling is at least partially based on said calculated channel quality indicators q_k.

26. (currently amended) A transmitting station in a wireless communication system, comprising an apparatus according to claim 25. ~~that schedules at least one out of K transmission channels $k=1,..,K$ with respective $N_{t,k}$ transmission interfaces and respective $N_{r,k}$ reception interfaces for the transmission of data symbols modulated according to a non-orthonormal matrix modulation that modulates data symbols in both~~

~~a non-orthogonal spatial domain and at least one orthogonal domain, wherein at least one equivalent channel matrix G_k can be defined that transforms said data symbols into data symbols that have been matrix modulated, transmitted over $N_{t,k}$ transmission interfaces and received at $N_{r,k}$ reception interfaces of one of said transmission channels $k=1,..,K$, and wherein an equivalent channel correlation matrix $R_k = G_k^H \cdot G_k$ of said at least one equivalent channel matrix G_k is not proportional to the identity matrix, said transmitting station comprising:~~

- ~~a calculation module for calculating a respective channel quality indicator q_k for at least one of said K transmission channels, and~~
- ~~a scheduler for scheduling at least one of said K transmission channels for the transmission of said matrix modulated data symbols, wherein said scheduling is at least partially based on said calculated channel quality indicators q_k.~~

27. (canceled)

28. (currently amended) An apparatus ~~device for scheduling at least one out of K transmission channels $k=1,..,K$ with respective $N_{t,k}$ transmission interfaces and respective $N_{r,k}$ reception interfaces for the transmission of data symbols, wherein at least two of said data symbols are transmitted in parallel from $N_{t,k}$ transmission interfaces of at least one of said K transmission channels, which is defined by a channel matrix H_k,~~
~~said device~~ comprising:

- a calculation module for calculating a respective channel quality indicator q_k for at least one of ~~said~~ K transmission channels $k=1,..,K$, wherein each transmission channel k has respective $N_{t,k}$ transmission interfaces and respective $N_{r,k}$ reception interfaces and is defined by a respective channel matrix H_k, wherein at least two data symbols are transmitted in parallel from $N_{t,k}$ transmission interfaces of at least one of said K transmission channels, and~~,~~ wherein at least one of said respective channel quality indicators q_k is calculated as a function of the determinant of a linear function of a

channel correlation matrix $H_k^H \cdot H_k$ of said channel matrix H_k, and

- a scheduler for scheduling at least one of said K transmission channels for the transmission of said data symbols, wherein said scheduling is at least partially based on said calculated channel quality indicators q_k.

29. (currently amended) A transmitting station in a wireless communication system comprising an apparatus according to claim 28.~~that schedules at least one out of~~ ~~K transmission channels $k=1,..,K$ with respective $N_{t,k}$ transmission interfaces and respective $N_{r,k}$ reception interfaces for the transmission of data symbols, wherein at least two of said data symbols are transmitted in parallel from $N_{t,k}$ transmission interfaces of at least one of said K transmission channels, which is defined by a channel matrix H_k,~~

~~said transmitting station comprising:~~

~~a calculation module for calculating a respective channel quality indicator q_k for at least one of said K transmission channels, wherein at least one of said respective channel quality indicators q_k is calculated as a function of the determinant of a linear function of a channel correlation matrix $H_k^H \cdot H_k$ of said channel matrix H_k, and~~

- ~~a scheduler for scheduling at least one of said K transmission channels for the transmission of said data symbols, wherein said scheduling is at least partially based on said calculated channel quality indicators q_k.~~

30. (canceled)

31. (currently amended) An apparatus ~~device for scheduling at least one out of K transmission channels $k=1,..,K$ with respective $N_{t,k}$ transmission interfaces and respective $N_{r,k}$ reception interfaces for the transmission of data symbols modulated according to a non-orthonormal matrix modulation that modulates data symbols in both a non-orthogonal spatial domain and at least one orthogonal domain, wherein at least one equivalent channel matrix G_k can be defined that transforms said data symbols into data symbols that~~

~~have been matrix modulated, transmitted over $N_{t,k}$ transmission interfaces and received at $N_{r,k}$ reception interfaces of one of said transmission channels $k=1,..,K$, and wherein an equivalent channel correlation matrix $R_k = G_k^H \cdot G_k$ of said at least one equivalent channel matrix G_k is not proportional to the identity matrix, said device~~ comprising:

- means for calculating a respective channel quality indicator q_k for at least one of said K transmission channels $k=1,..,K$ with respective $N_{t,k}$ transmission interfaces and respective $N_{r,k}$ reception interfaces, and
- means for scheduling at least one of said K transmission channels for the transmission of data symbols modulated according to a non-orthonormal matrix modulation that modulates data symbols in both a non-orthogonal spatial domain and at least one orthogonal domain, wherein at least one equivalent channel matrix G_k can be defined that transforms said data symbols into data symbols that have been matrix modulated, transmitted over $N_{t,k}$ transmission interfaces and received at $N_{r,k}$ reception interfaces of one of said transmission channels $k=1,..,K$, wherein an equivalent channel correlation matrix $R_k = G_k^H \cdot G_k$ of said at least one equivalent channel matrix G_k is not proportional to the identity matrix~~said matrix modulated data symbols~~, and wherein said scheduling is at least partially based on said calculated channel quality indicators q_k.

32. (new) An apparatus comprising:

- means for calculating a respective channel quality indicator q_k for at least one of K transmission channels $k=1,..,K$, wherein each transmission channel k has respective $N_{t,k}$ transmission interfaces and respective $N_{r,k}$ reception interfaces and is defined by a respective channel matrix H_k, wherein at least two data symbols are transmitted in parallel from $N_{t,k}$ transmission interfaces of at least one of said K transmission channels, and wherein at least one of said respective channel quality indicators q_k is calculated as a function of the determinant of a linear function of a channel correlation matrix $H_k^H \cdot H_k$ of said channel matrix H_k, and
- means for scheduling at least one of said K transmission channels for the transmission of said data symbols, wherein said scheduling is at least partially based on said

calculated channel quality indicators q_k.

33. (new) A computer program product comprising a computer program with instructions stored in a memory, said instructions operable to cause a processor to perform the method of claim 19.